

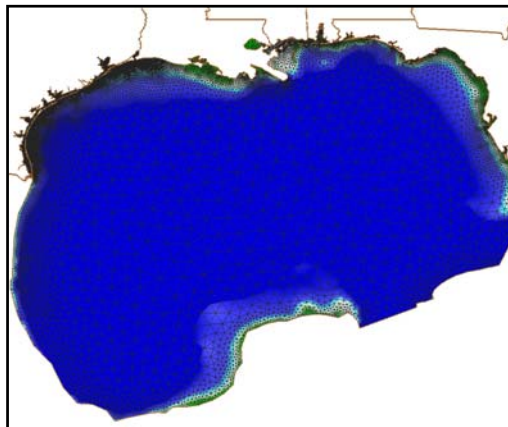


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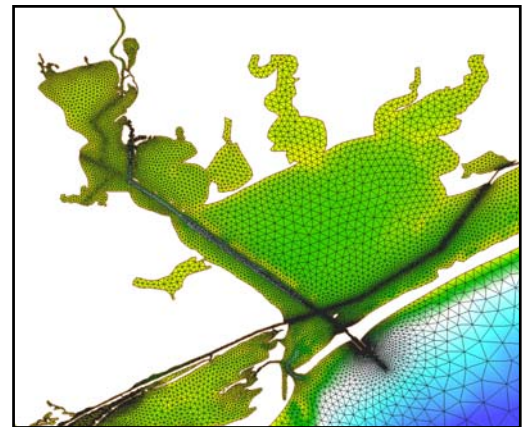
Advanced Circulation Model (ADCIRC)

Description

ADCIRC is a finite element hydrodynamic circulation numerical model for the simulation of water level and current over an unstructured gridded domain. ADCIRC can be run either as a two-dimensional depth integrated (2DDI) model or as a three-dimensional (3D) model. ADCIRC can be used for modeling tidally-, and wind- and wave-driven circulation in coastal waters; forecasting hurricane storm surge and flooding; inlet sediment transport/morphology change studies, and dredging/material disposal studies. ADCIRC has been certified by FEMA for use in performing storm surge analyses.



Gulf of Mexico regional grid.



Portion of regional grid showing fine resolution in Matagorda Bay, Texas.

Benefits

ADCIRC simulates tidal circulation and storm surge propagation over large computational domains, eliminating the need for imposing approximate open-water boundary conditions that can create inaccuracies in model results, while simultaneously providing high resolution in areas of complex shoreline and bathymetry where it is needed to maximize simulation accuracy. The targeted areas for ADCIRC application include continental shelves, nearshore coastal areas, inlets, and estuaries.

The USACE is responsible for the design, modification, and operation and maintenance of Federal inlet navigation channels, jetties, and associated waterways to accommodate present and future vessel requirements. Comprehensive predictive models such as ADCIRC are needed to support O&M activities to minimize dredging, maintain channel reliability, manage inlet and adjacent beach sediment, and predict navigation project performance.

Prediction of potential storm water levels is critical in the design of flood and storm damage reduction projects, protection of facilities and infrastructure, and beneficial to planning and evacuation of low-lying areas if a storm event occurs.

Status	Features available in ADCIRC include: wetting/drying of low-lying areas, overflow and throughflow barriers, bridge piers, wave radiation stresses, sediment transport, and morphology change. Planned enhancements include modeling salinity, contaminant transport, three-dimensional sediment transport/morphology change modeling, and additional sediment transport algorithms. The model can be run as a single processor code or in parallel mode running efficiently on hundreds of processors.
Distribution Source(s)	<p>Corps Users can obtain ADCIRC in the SMS distribution located at http://chl.erd.usace.army.mil/sms.</p> <p>Non-Corps Users can obtain ADCIRC in the SMS distribution located at: www.ems-i.com, http://www.veritechinc.net/, http://www.bossintl.com/html/adcirc.html or by contacting Dr. Joannes Westerink (jjw@photius.ce.nd.edu) or Dr. Rick Luettich (rick_luettich@unc.edu) directly.</p>
Available Documentation	<p>Luettich, R.A., Jr., J.J. Westerink, and N.W. Scheffner, 1992, ADCIRC: an advanced three-dimensional circulation model for shelves coasts and estuaries, report 1: theory and methodology of ADCIRC-2DDI and ADCIRC-3DL, Dredging Research Program Technical Report DRP-92-6, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS.</p> <p>http://www.marine.unc.edu/C_CATS/adcirc/adcirc.htm has links to PDF versions of the ADCIRC User's Manual and ADCIRC Theory Report in addition to an on-line User's Manual.</p>
Available Training	<p>The ERDC/CHL Coastal Inlets Research Program jointly with the University of Notre Dame and the FSBPA holds annual Training Workshops to train Corps and non-Corps personnel to apply ADCIRC and other Corps modeling technology to project sites. Specialized, project-level training is also available on an as-needed basis from ERDC/CHL, and FEMA contractors can receive specialized storm surge training from the University of Notre Dame directly. Commercial vendors that provide training include: http://training.bossintl.com/html/sms-training.html, and http://www.ems-i.com/Training/training.html.</p>
Available Support	<p>Corps users should e-mail their questions to the SMS Help Desk: SMS@erdc.usace.army.mil. Non-Corps users should contact their SMS vendor or their ADCIRC provider.</p>
Application	<p>Example applications are listed at: http://www.marine.unc.edu/C_CATS/adcirc/adcirc.htm, http://cirp.wes.army.mil/cirp/studies.html.</p>
Point of Contact	<p>Mary A. Cialone, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, Mary.A.Cialone@erdc.usace.army.mil, Additional information can be found at http://www.marine.unc.edu/C_CATS/adcirc/document/ADCIRC_main_frame.html.</p>
Partners	<p>ERDC; University of Notre Dame, University of North Carolina – Chapel Hill, University of Oklahoma, University of Texas at Austin, Texas A&M University, Lund University.</p>